

## Schottky Diode, 0.5 A



SOD-123



### FEATURES

- Surface mountable
- Very low forward voltage drop
- Extremely fast switching
- Negligible switching losses
- Guard ring for enhanced ruggedness and long term reliability
- Lead (Pb)-free ("PbF" suffix)
- Designed and qualified for industrial level


**RoHS\***  
COMPLIANT

### PRODUCT SUMMARY

$I_{F(AV)}$	0.5 A
$V_R$	20 V
$V_F$ at 0.5 A at 25 °C	0.440 V
$I_{RM}$	7 mA at 100 °C

### DESCRIPTION

This Schottky diode is ideally suited for low voltage, high frequency operation, as freewheeling and polarity protection. Small size of the package allows proper use in application where compact size is critical, fitting also the GSM and PCMCIA requirement.

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_F$	DC	0.5	A
$V_{RRM}$		20	V
$I_{FSM}$	$t_p = 10$ ms sine	6.5	A
$V_F$	0.5 Apk, $T_J = 100$ °C	0.36	V
$T_J$	Range	- 65 to 150	°C

### VOLTAGE RATINGS

PARAMETER	SYMBOL	MBR0520PbF	UNITS
Maximum DC reverse voltage	$V_R$	20	V
Maximum working peak reverse voltage	$V_{RWM}$		

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current	$I_F$	DC, $T_L = 129$ °C		05	A
Maximum peak one cycle non-repetitive surge current at 25 °C	$I_{FSM}$	5 $\mu$ s sine or 3 $\mu$ s rect. pulse	Following any rated load condition and with rated $V_{RRM}$ applied	55	
		10 ms sine or 6 ms rect. pulse		6.5	

\* Pb containing terminations are not RoHS compliant, exemptions may apply



ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	$V_{FM}^{(1)}$	0.1 A	$T_J = 25\text{ }^\circ\text{C}$	0.373	V
		0.5 A		0.440	
		0.1 A	$T_J = 100\text{ }^\circ\text{C}$	0.260	
		0.5 A		0.360	
Maximum reverse leakage current	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = 10\text{ V}$	40	$\mu\text{A}$
		$T_J = 100\text{ }^\circ\text{C}$		3	mA
		$T_J = 25\text{ }^\circ\text{C}$	$V_R = 20\text{ V}$	150	$\mu\text{A}$
		$T_J = 100\text{ }^\circ\text{C}$		7	mA
Maximum junction capacitance	$C_T$	$V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) $T_J = 25\text{ }^\circ\text{C}$		110	pF
Maximum voltage rate of change	dV/dt	Rated $V_R$		10 000	V/ $\mu\text{s}$

**Note**

(1) Pulse width < 300  $\mu\text{s}$ , duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum junction and storage temperature range	$T_J^{(1)}, T_{Stg}$			- 65 to 150	$^\circ\text{C}$
Maximum thermal resistance, junction to lead	$R_{thJL}$	Mounted on PC board FR4 with minimum pad size		150	$^\circ\text{C/W}$
Maximum thermal resistance, junction to ambient	$R_{thJA}$	1" square pad size (1 x 0.5" for each lead) on FR4 board		200	
Approximate weight				0.012	g
Marking device		Case style SOD-123		AYWLC	

**Note**

(1)  $\frac{dP_{tot}}{dT_J} < \frac{1}{R_{thJA}}$  thermal runaway condition for a diode on its own heatsink

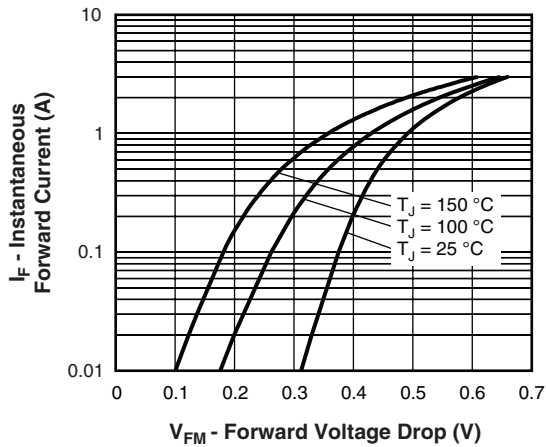


Fig. 1 - Maximum Forward Voltage Drop Characteristics

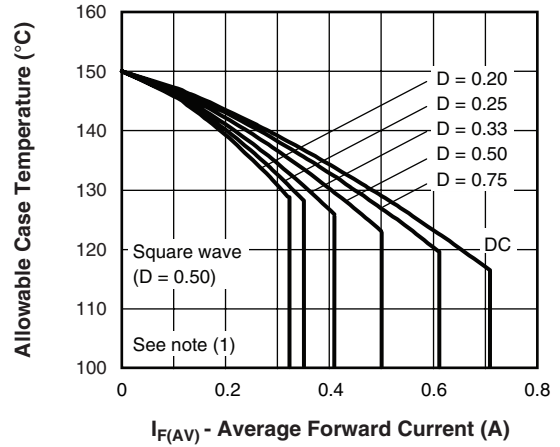


Fig. 4 - Maximum Allowable Case Temperature vs. Average Forward Current

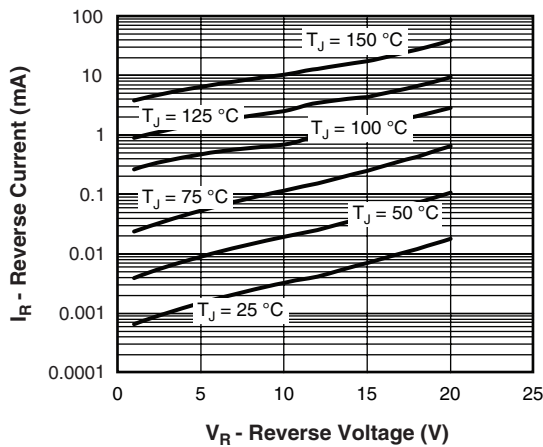


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

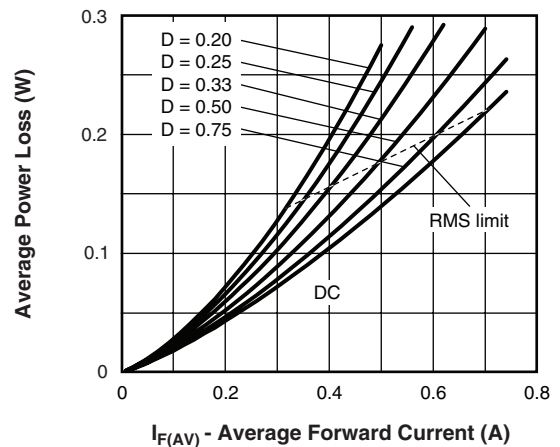


Fig. 5 - Forward Power Loss Characteristics

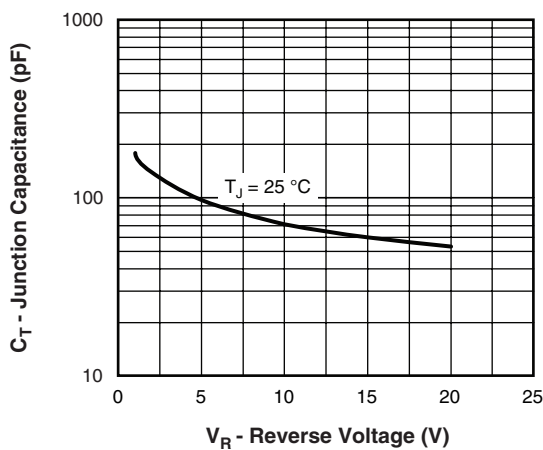


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

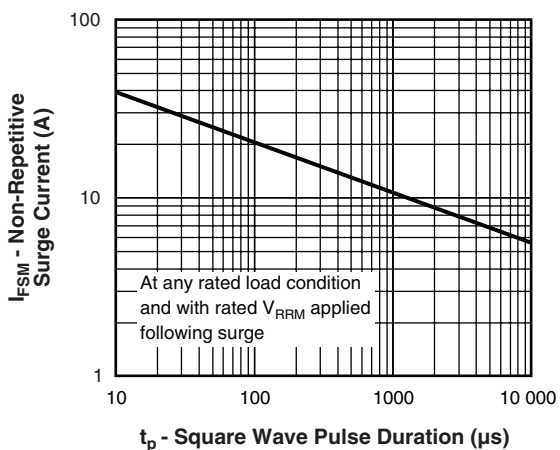


Fig. 6 - Maximum Non-Repetitive Surge Current

**Note**

 (1) Formula used:  $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$ ;

 $P_d$  = Forward power loss =  $I_{F(AV)} \times V_{FM}$  at  $(I_{F(AV)}/D)$  (see fig. 6);  $P_{d_{REV}}$  = Inverse power loss =  $V_{R1} \times I_R (1 - D)$ ;  $I_R (1 - D)$

# MBR0520PbF

Vishay High Power Products Schottky Diode, 0.5 A



## ORDERING INFORMATION TABLE

DEVICE	PACKAGE	MARKING	BASE QUANTITY	DELIVERY MODE
MBR0520	SOD-123	A $\overline{Y}$ WLC	3000	Tape and reel

## LINKS TO RELATED DOCUMENTS

Dimensions	<a href="http://www.vishay.com/doc?95053">http://www.vishay.com/doc?95053</a>
Part marking information	<a href="http://www.vishay.com/doc?95338">http://www.vishay.com/doc?95338</a>
Packaging information	<a href="http://www.vishay.com/doc?95061">http://www.vishay.com/doc?95061</a>



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